

What is claimed is:

1. A composite comprising:  
a dielectric matrix; and  
nano magnetic particles contained in the matrix.
2. The composite according to claim 1, wherein the nano magnetic particles are non-spherical.
3. The composite according to claim 2, wherein spherical nano magnetic particles are added to the non-spherical nano magnetic particles.
4. The composite according to claim 1, wherein the nano magnetic particles are spherical.
5. The composite according to claim 1, wherein the matrix is made of one selected from the group consisting of silica, alumina and hydrosilsesquioxane.
6. The composite according to claim 1, wherein the matrix is made of one selected from the group consisting of polyimide, PMMA and methyl silsesquioxane.
7. The composite according to claim 1, wherein the nano magnetic particles are superparamagnetic.
8. The composite according to claim 7, wherein diamagnetic nano magnetic particles are added to the superparamagnetic nano particles.
9. The composite according to claim 8, wherein the diamagnetic nano particles include indium (In).
10. The composite according to claim 1, wherein the nano magnetic particles are diamagnetic.

11. The composite according to claim 1, wherein the nano magnetic particles consists of ( $\gamma$ -Fe<sub>2</sub>O<sub>3</sub>), chromium oxide (CrO<sub>2</sub>), europium oxide (EuO), NiZn-ferrite, MnZn-ferrite or Yttrium-iron garnet.

12. The composite according to claim 2, wherein the nano magnetic particles include indium.

13. A semiconductor device comprising:  
a semiconductor substrate; and  
an insulator made of a composite having a dielectric matrix, and nano magnetic particles contained in the matrix.

14. The semiconductor device according to claim 13, wherein the nano magnetic particles are non-spherical.

15. The semiconductor device according to claim 13, wherein the nano magnetic particles are spherical.

16. The semiconductor device according to claim 13, wherein the nano magnetic particles are superparamagnetic.

17. The semiconductor device according to claim 15, wherein diamagnetic nano magnetic particles are added to the superparamagnetic nano particles.

18. An optical device comprising:  
a transparent dielectric matrix; and  
a composite having nano magnetic particles contained in the matrix.

19. The optical device according to claim 18, wherein the nano magnetic particles are non-spherical.

1           20.    The optical device according to claim 18, wherein the nano magnetic  
2 particles are spherical.

1           21.    A method for manufacturing a composite comprising the steps of:  
2 forming nano magnetic particles; and  
3 distributing the nano magnetic particles into a dielectric matrix.

1           22.    The method according to claim 21, wherein the step of forming nano  
2 magnetic particles includes the steps of mixing a cation surfactant with an anion  
3 surfactant of a metal salt and subjecting the mixture to chemical sedimentation to  
4 form non-spherical nano magnetic particles.